

## **Land Use: 110**

### **General Light Industrial**

#### **Description**

Light industrial facilities are free-standing facilities devoted to a single use. The facilities have an emphasis on activities other than manufacturing and typically have minimal office space. Typical light industrial activities include printing, material testing and assembly of data processing equipment. General heavy industrial (Land Use 120), industrial park (Land Use 130) and manufacturing (Land Use 140) are related uses.

#### **Additional Data**

No vehicle occupancy data were available specifically for general light industrial, but the average was approximately 1.3 persons per automobile for all industrial uses.

The peak hour of the generator typically coincided with the peak hour of the adjacent street traffic.

Facilities with employees on shift work may peak at other hours.

The sites were surveyed in the early 1970s, the mid- to late 1980s and the 2000s throughout the United States.

#### **Source Numbers**

7, 9, 10, 11, 15, 17, 88, 174, 179, 184, 191, 192, 251, 253, 286, 300, 611

## Land Use: 130

### Industrial Park

#### Description

Industrial parks contain a number of industrial or related facilities. They are characterized by a mix of manufacturing, service and warehouse facilities with a wide variation in the proportion of each type of use from one location to another. Many industrial parks contain highly diversified facilities—some with a large number of small businesses and others with one or two dominant industries. General light industrial (Land Use 110), general heavy industrial (Land Use 120), manufacturing (Land Use 140), high-cube warehouse/distribution center (Land Use 152) and business park (Land Use 770) are related uses.

#### Additional Data

Average weekday transit trip ends:

- 0.03 per employee
- 0.05 per 1,000 square feet gross floor area
- 0.69 per acre

Truck trips accounted for 1 to 31 percent of the weekday traffic. The average was approximately 13 percent. This average was based on all sites surveyed.

Vehicle occupancy ranged from 1.2 to 1.8 persons per automobile on an average weekday. The average for the sites where these data were available was 1.37.

The peak hour of the generator typically coincided with the peak hour of the adjacent street traffic.

Facilities with employees on shift work may peak at other hours.

The sites were surveyed in the late 1960s, the early 1970s, the mid-1980s and the 2000s throughout the United States.

#### Source Numbers

3, 7, 10, 14, 68, 74, 85, 91, 100, 146, 162, 184, 251, 277, 422, 706

# Land Use: 140

## Manufacturing

### Description

Manufacturing facilities are areas where the primary activity is the conversion of raw materials or parts into finished products. Size and type of activity may vary substantially from one facility to another. In addition to the actual production of goods, manufacturing facilities generally also have office, warehouse, research and associated functions. General light industrial (Land Use 110), general heavy industrial (Land Use 120), industrial park (Land Use 130) and high-cube warehouse/distribution center (Land Use 152) are related uses.

### Additional Data

Average weekday transit trip ends:

- 0.09 per employee
- 0.08 per 1,000 square feet gross floor area
- 1.25 per acre

Vehicle occupancy ranged from 1.2 to 1.3 persons per automobile on an average weekday.

The peak hour of the generator typically coincided with the peak hour of the adjacent street traffic.

Facilities with employees on shift work may peak at other hours.

The sites were surveyed in the late 1960s, the early 1970s, the mid-1980s, the 1990s and the 2000s throughout the United States.

### Source Numbers

3, 7, 10, 15, 17, 74, 85, 88, 177, 184, 241, 357, 384, 418, 443, 583, 598, 611, 728

## Land Use: 150 Warehousing

### Description

Warehouses are primarily devoted to the storage of materials, but they may also include office and maintenance areas. High-cube warehouse/distribution center (Land Use 152) and business park (Land Use 770) are related uses.

### Additional Data

Truck trips accounted for 20 percent of the weekday traffic at one of the sites surveyed.

No vehicle occupancy data were available specifically for warehousing, but the average was approximately 1.3 persons per automobile for all industrial uses.

The peak hour of the generator typically coincided with the peak hour of the adjacent street traffic.

Facilities with employees on shift work may peak at other hours.

Two sources indicated that the warehousing sites comprised multiple buildings.

The sites were surveyed from between the late 1960s and the 2000s throughout the United States and Canada.

### Source Numbers

6, 7, 12, 13, 15, 17, 74, 184, 192, 390, 406, 411, 436, 443, 571, 579, 583, 596, 598, 611

## Land Use: 151

### Mini-Warehouse

#### Description

Mini-warehouses are buildings in which a number of storage units or vaults are rented for the storage of goods. They are typically referred to as "self-storage" facilities. Each unit is physically separated from other units, and access is usually provided through an overhead door or other common access point.

#### Additional Data

Truck trips accounted for 2 to 15 percent of the weekday traffic at the sites where data were available.

Vehicle occupancy ranged from 1.2 to 1.9 persons per automobile on an average weekday.

Peak hours of the generator—

The weekday P.M. peak hour was between 12:00 p.m. and 7:00 p.m. The Saturday peak hour was between 10:00 a.m. and 1:00 p.m. The Sunday peak hour was between 1:00 p.m. and 6:00 p.m.

For the purpose of this land use, the independent variable "occupied storage units" is defined as the number of units that have been rented.

The sites were surveyed between 1979 and 2008 in California, Colorado, Massachusetts, New Jersey and Texas.

#### Source Numbers

113, 212, 403, 551, 568, 642, 708, 724

## Land Use: 152

### High-Cube Warehouse/Distribution Center

#### Description

High-cube warehouses/distribution centers are used for the storage of materials, goods and merchandise prior to their distribution to retail outlets, distribution centers or other warehouses. These facilities are typically characterized by ceiling heights of at least 24 feet with small employment counts due to a high level of mechanization. High-cube warehouses/distribution centers generally consist of large steel or masonry shell buildings and may be occupied by single or multiple tenants. A small ancillary office use component may be included and some limited assembly and repackaging may occur within these facilities.

High-cube warehouses/distribution centers may be located in industrial parks or be free-standing. Intermodal truck terminal (Land Use 030), industrial park (Land Use 130), manufacturing (Land Use 140) and warehousing (Land Use 150) are related uses.

#### Additional Data

**Caution should be exercised when using the trip generation rates provided for this land use.** The operational characteristics of the facilities contained in this land use may vary widely. The studies contained in this land use did not provide specific information on duration of storage, hours of operation or turnover rates. It is anticipated that facilities serving primarily a distribution function with high inventory turnover rates and very short-term storage functions would result in higher trip generation rates than facilities with longer term storage and lower turnover rates. **To assist in the future analysis and potential stratification of this land use, it is important that this information be collected and provided to ITE.**

Peak truck activities typically occur outside the peak hour of adjacent street traffic.

Truck trips accounted for 9 to 29 percent of the peak hour traffic at the sites that provided truck trip information.

Average truck trip generation rates for five sites are summarized in the table below. The average gross floor area of these facilities is 1,020,238 square feet. These sites are located in a rural area.

## Land Use: 210

### Single-Family Detached Housing

#### Description

Single-family detached housing includes all single-family detached homes on individual lots. A typical site surveyed is a suburban subdivision.

#### Additional Data

The number of vehicles and residents had a high correlation with average weekday vehicle trip ends. The use of these variables was limited, however, because the number of vehicles and residents was often difficult to obtain or predict. The number of dwelling units was generally used as the independent variable of choice because it was usually readily available, easy to project and had a high correlation with average weekday vehicle trip ends.

This land use included data from a wide variety of units with different sizes, price ranges, locations and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

Single-family detached units had the highest trip generation rate per dwelling unit of all residential uses because they were the largest units in size and had more residents and more vehicles per unit than other residential land uses; they were generally located farther away from shopping centers, employment areas and other trip attractors than other residential land uses; and they generally had fewer alternative modes of transportation available because they were typically not as concentrated as other residential land uses.

The peak hour of the generator typically coincided with the peak hour of the adjacent street traffic.

The sites were surveyed between the late 1960s and the 2000s throughout the United States and Canada.

#### Source Numbers

1, 4, 5, 6, 7, 8, 11, 12, 13, 14, 16, 19, 20, 21, 26, 34, 35, 36, 38, 40, 71, 72, 84, 91, 98, 100, 105, 108, 110, 114, 117, 119, 157, 167, 177, 187, 192, 207, 211, 246, 275, 283, 293, 300, 319, 320, 357, 384, 435, 550, 552, 579, 598, 601, 603, 611, 614, 637, 711, 735

## Land Use: 220 Apartment

### Description

Apartments are rental dwelling units located within the same building with at least three other dwelling units, for example, quadrplexes and all types of apartment buildings. The studies included in this land use did not identify whether the apartments were low-rise, mid-rise, or high-rise. Low-rise apartment (Land Use 221), high-rise apartment (Land Use 222) and mid-rise apartment (Land Use 223) are related uses.

### Additional Data

This land use included data from a wide variety of units with different sizes, price ranges, locations and ages. Consequently, there was a wide variation in trips generated within this category. Other factors, such as geographic location and type of adjacent and nearby development, may also have had an effect on the site trip generation.

The peak hour of the generator typically coincided with the peak hour of the adjacent street traffic.

The sites were surveyed between the late 1960s and the 2000s throughout the United States and Canada.

***Many of the studies included in this land use did not indicate the total number of bedrooms. To assist in the future analysis of this land use, it is important that this information be collected and included in trip generation data submissions.***

### Source Numbers

2, 4, 5, 6, 9, 10, 11, 12, 13, 14, 16, 19, 20, 34, 35, 40, 72, 91, 100, 108, 188, 192, 204, 211, 253, 283, 357, 436, 525, 530, 579, 583, 638

## Land Use: 230

### Residential Condominium/Townhouse

#### Description

Residential condominiums/townhouses are defined as ownership units that have at least one other owned unit within the same building structure. **Both condominiums and townhouses are included in this land use.** The studies in this land use did not identify whether the condominiums/townhouses were low-rise or high-rise. Low-rise residential condominium/townhouse (Land Use 231), high-rise residential condominium/townhouse (Land Use 232) and luxury condominium/townhouse (Land Use 233) are related uses.

#### Additional Data

The number of vehicles and the number of residents had a high correlation with average weekday vehicle trip ends. The use of these variables was limited, however, because the number of vehicles and residents was often difficult to obtain or predict. The number of dwelling units was generally used as the independent variable of choice because it is usually readily available, easy to project and had a high correlation with average weekday vehicle trip ends.

The peak hour of the generator typically coincided with the peak hour of the adjacent street traffic.

The sites were surveyed between the mid-1970s and the 2000s throughout the United States and Canada.

#### Source Numbers

4, 92, 94, 95, 97, 100, 105, 106, 114, 168, 186, 204, 237, 253, 293, 319, 320, 321, 390, 412, 418, 561, 562, 583, 638

# Land Use: 310

## Hotel

### Description

Hotels are places of lodging that provide sleeping accommodations and supporting facilities such as restaurants, cocktail lounges, meeting and banquet rooms or convention facilities, limited recreational facilities (pool, fitness room), and/or other retail and service shops. Some of the sites included in this land use category are actually large motels providing the hotel facilities noted above. All suites hotel (Land Use 311), business hotel (Land Use 312), motel (Land Use 320) and resort hotel (Land Use 330) are related uses.

### Additional Data

Studies of hotel employment density indicate that, on the average, a hotel will employ 0.9 employees per room.<sup>1</sup>

Thirty studies provided information on occupancy rates at the time the studies were conducted. The average occupancy rate for these studies was approximately 83 percent.

The hotels surveyed were primarily located outside central business districts in suburban areas.

Some properties contained in this land use provide guest transportation services such as airport shuttles, limousine service, or golf course shuttle service, which may have an impact on the overall trip generation rates.

The sites were surveyed between the late 1960s and the 2000s throughout the United States.

*For all lodging uses, it is important to collect data on occupied rooms as well as total rooms in order to accurately predict trip generation characteristics for the site.*

Trip generation at a hotel may be related to the presence of supporting facilities such as convention facilities, restaurants, meeting/banquet space and retail facilities. Future data submissions should specify the presence of these amenities. Reporting the level of activity at the supporting facilities such as full, empty, partially active, number of people attending a meeting/banquet during observation may also be useful in further analysis of this land use.

### Source Numbers

4, 5, 12, 13, 18, 55, 72, 170, 187, 254, 260, 262, 277, 280, 301, 306, 357, 422, 436, 507, 577, 728

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<sup>1</sup> Buttke, Carl H. Unpublished studies of building employment densities, Portland, Oregon.

# Land Use: 311

## All Suites Hotel

### Description

All suites hotels are places of lodging that provide sleeping accommodations, a small restaurant and lounge and small amounts of meeting space. Each suite includes a sitting room and separate bedroom; limited kitchen facilities are provided within the suite. These hotels are located primarily in suburban areas. Hotel (Land Use 310), business hotel (Land Use 312), motel (Land Use 320) and resort hotel (Land Use 330) are related uses.

### Additional Data

Only one hotel provided employment data; this site had 0.10 employees per room.

Four studies provided information on occupancy rates at the time the studies were conducted. The average occupancy rate for these studies was approximately 74 percent.

The peak hour of the generator typically coincided with the peak hour of the adjacent street traffic.

The sites were surveyed in the mid-1980s and the 1990s in Florida and Georgia.

***For all lodging uses, it is important to collect data on occupied rooms as well as total rooms in order to accurately predict trip generation characteristics for the site.***

### Source Numbers

216, 436

## Land Use: 813

### Free-Standing Discount Superstore

#### Description

The discount superstores in this category are similar to the free-standing discount stores described in Land Use 815 with the exception that they also contain a full service grocery department under the same roof that shares entrances and exits with the discount store area. The stores usually offer a variety of customer services, centralized cashiering and a wide range of products. They typically maintain long store hours 7 days a week. The stores included in this land use are often the only ones on the site, but they can also be found in mutual operation with a related or unrelated garden center and/or service station, or as a part of a shopping center, with or without their own dedicated parking area. Free-standing discount store (Land Use 815) is a related use.

#### Additional Data

Peak hours of the generator—

The weekday A.M. peak hour was generally between 10:00 a.m. and 11:00 a.m. The weekday P.M. peak hour varied between 12:00 p.m. and 5:00 p.m. The Saturday and Sunday peak hours varied between 12:00 p.m. and 5:00 p.m.

The weighted average truck trip generation rates from approximately 30 sites surveyed for this land use are summarized in the table below. The average gross floor area of these facilities is 206,000 square feet.

Day/Time Period	Weighted Average Truck Trip Generation Rate (trip ends per 1,000 square feet)
Weekday	0.87
Weekday A.M. Peak Hour of Adjacent Street Traffic	0.05
Weekday P.M. Peak Hour of Adjacent Street Traffic	0.03
Weekday A.M. Peak Hour of Generator	0.06
Weekday P.M. Peak Hour of Generator	0.04
Saturday	0.59
Saturday Peak Hour of Generator	0.04
Sunday	0.43
Sunday Peak Hour of Generator	0.02

One source provided information on trip generation rates for what the study defined as "typical" and "peak" seasons. These data indicated that weekday trip generation rates were similar in both seasons. However, trip generation rates on Saturdays during peak season were 13 to 20 percent higher than a typical season; Sunday rates were found to be 6 to 10 percent higher. For the purposes of this analysis, "peak" season was defined as the period between the week after

Thanksgiving and the week prior to Christmas; "typical" season was defined as September through mid-November when transactions are close to average. The seasonal trip generation information provided was based on a sample of five sites.

Information on approximate hourly variation in free-standing discount superstore traffic is shown in the table below. It should be noted, however, that the information contained in this table is based on a limited sample size. Therefore, caution should be exercised when applying the data. Also, some information provided in the table may conflict with the results obtained by applying the average rate or regression equations. When this occurs, it is suggested that the results from the average rate or regression equations be used, as they are based on a larger number of studies.

**Hourly Variation in Free-Standing Discount Superstore Traffic**

Time	Average Weekday <sup>a</sup>		Average Saturday <sup>b</sup>		Average Sunday <sup>c</sup>	
	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic	Percent of 24-Hour Entering Traffic	Percent of 24-Hour Exiting Traffic
6 a.m.–7 a.m.	1.5	1.2	1.0	1.1	0.9	1.3
7 a.m.–8 a.m.	2.6	2.4	2.2	2.1	2.0	2.3
8 a.m.–9 a.m.	4.1	3.3	3.8	3.2	3.4	3.4
9 a.m.–10 a.m.	6.0	4.6	5.7	4.6	5.4	5.1
10 a.m.–11 a.m.	7.3	6.0	7.0	6.2	7.2	5.8
11 a.m.–12 p.m.	7.5	7.3	8.4	7.4	8.6	7.5
12 p.m.–1 p.m.	8.3	7.7	9.0	8.0	9.4	8.0
1 p.m.–2 p.m.	7.8	7.7	8.9	8.6	9.5	9.2
2 p.m.–3 p.m.	8.0	7.7	8.4	7.9	8.3	8.6
3 p.m.–4 p.m.	7.7	7.7	7.6	7.9	8.4	8.7
4 p.m.–5 p.m.	7.8	8.0	7.4	7.7	7.9	7.8
5 p.m.–6 p.m.	7.1	7.3	7.0	7.5	6.9	7.2
6 p.m.–7 p.m.	6.7	6.7	6.3	6.8	6.4	6.7
7 p.m.–8 p.m.	5.7	6.1	5.4	5.9	5.0	5.1
8 p.m.–9 p.m.	4.4	5.2	4.4	5.0	4.0	3.6
9 p.m.–10 p.m.	3.0	4.0	3.5	3.7	2.9	2.9
10 p.m.–6 a.m.	4.5	7.2	3.9	6.4	3.8	6.8

Sites ranged in size from 123,000 to 224,000 square feet gross floor area

<sup>a</sup> Source numbers – 354, 595 and 618; based on 11 studies

<sup>b</sup> Source numbers – 354 and 618; based on nine studies

<sup>c</sup> Source number – 354; based on eight studies

Garden centers contained within the principal outside faces of the exterior building walls were included in the gross square floor areas reported. Outdoor or fenced-in areas outside the principal

faces of the exterior walls were excluded. Please refer to Volume 1, User's Guide, for a more detailed definition of gross floor area.

Several sites included in this land use indicated the presence of fenced/covered space.

The sites were surveyed between the 1990s and the 2000s throughout the United States.

To assist in the future analysis of this land use, it is important to collect and include information on the presence and size of garden centers, outdoor fenced-in space and service stations in trip generation data submissions.

### **Source Numbers**

354, 522, 577, 595, 607, 609, 612, 618, 625, 630, 636, 651, 652, 661, 700, 731, 735

## **Land Use: 817**

### **Nursery (Garden Center)**

#### **Description**

A nursery or garden center is a free-standing building with an outside storage area for planting or landscape stock. The nurseries surveyed primarily serve the general public. Some have large greenhouses and offer landscaping services. Most have office, storage and shipping facilities. Nurseries are characterized by seasonal variations in trip characteristics. Nursery (Wholesale) (Land Use 818) is a related use.

#### **Additional Data**

Outside storage areas are not included in the overall gross floor area measurements. However, if storage areas are located within the principal outside faces of the exterior walls, they are included in the overall gross floor area of the building.

The sites were surveyed in the 1980s in California.

#### **Source Numbers**

205, 240

## **Land Use: 826**

### **Specialty Retail Center**

#### **Description**

Specialty retail centers are generally small strip shopping centers that contain a variety of retail shops and specialize in quality apparel, hard goods and services, such as real estate offices, dance studios, florists and small restaurants. Shopping center (Land Use 820) is a related use.

#### **Additional Data**

The sites were surveyed between the late 1970s and the 2000s in California, Florida, Georgia, New York and Pennsylvania.

#### **Source Numbers**

100, 304, 305, 367, 423, 507, 577

# Land Use: 850

## Supermarket

### Description

Supermarkets are free-standing retail stores selling a complete assortment of food, food preparation and wrapping materials, and household cleaning items. Supermarkets may also contain the following products and services: ATMs, automobile supplies, bakeries, books and magazines, dry cleaning, floral arrangements, greeting cards, limited-service banks, photo centers, pharmacies and video rental areas. Some facilities may be open 24 hours a day. Discount supermarket (Land Use 854) is a related use.

### Additional Data

*Caution should be used when applying daily trip generation rates for supermarkets, as the database contains a mixture of facilities with varying hours of operation. Future data submissions should specify hours of operation of a site.*

### Specialized Land Use Data

One study provided data on a supermarket in Oregon that also carried clothing, footwear, bedding, furniture, jewelry, beauty products, electronics, toys, lumber and garden supplies. The secondary products offered at this supermarket varied from the other stores in this land use; therefore, the information collected for this facility is presented in the following table and was excluded from the data plots. The weekday morning and afternoon peak hours of the generator at this site were between 8:45 a.m. and 9:45 a.m. and between 4:45 p.m. and 5:45 p.m., respectively. The Saturday and Sunday peak hours of the generator were between 3:00 p.m. and 4:00 p.m. and between 12:45 p.m. and 1:45 p.m., respectively.

<u>Independent Variable</u>	<u>Trip Generation Rate</u>	<u>Size of Independent Variable</u>	<u>Number of Studies</u>	<u>Directional Distribution</u>
<b>1,000 Square Feet Gross Floor Area</b>				
Weekday A.M. Peak Hour of Generator	4.21	78	1	Not available
Weekday P.M. Peak Hour of Generator	10.13	78	1	Not available
Saturday Peak Hour of Generator	10.91	78	1	Not available
Sunday Peak Hour of Generator	9.83	78	1	Not available

Source: 746

The sites were surveyed between the 1960s and the 2000s throughout the United States.

### Source Numbers

2, 4, 5, 72, 98, 203, 213, 251, 273, 305, 359, 365, 438, 442, 447, 448, 514, 520, 552, 577, 610, 716, 746

## Land Use: 862

### Home Improvement Superstore

#### Description

Home improvement superstores are free-standing facilities that specialize in the sale of home improvement merchandise. These stores generally offer a variety of customer services and centralized cashiering. Home improvement superstores typically maintain long store hours 7 days a week. Examples of items sold in these stores include lumber, tools, paint, lighting, wallpaper and paneling, kitchen and bathroom fixtures, lawn equipment, and plant and garden accessories. The stores included in this land use are often the only ones on the site, but they can also be found in mutual operation with a related or unrelated garden center. Home improvement superstores are sometimes found as separate parcels within a retail complex, with or without their own dedicated parking. The buildings contained in this land use usually range in size from 50,000 to 200,000 square feet gross floor area. This land use does not include interior design stores. Building materials and lumber store (Land Use 812) and hardware/paint store (Land Use 816) are related uses.

#### Additional Data

Peak hours of the generator—

The weekday A.M. peak hour varied between 10:00 a.m. and 12:00 p.m. The weekday P.M. peak hour varied between 12:00 p.m. and 5:00 p.m. The weekend peak hour varied between 12:00 p.m. and 3:00 p.m.

Outside storage areas are not included in the overall gross floor area measurements. However, if storage areas are located within the principal outside faces of the exterior walls, they are included in the overall gross floor area of the building.

Garden centers contained within the principal outside faces of the exterior building walls were included in the gross square floor areas reported. Outdoor or fenced-in areas outside the principal faces of the exterior building walls were excluded. Please refer to Volume 1, User's Guide, for a more detailed definition of gross floor area.

The sites were surveyed between the 1980s and the 2000s throughout the United States.

***To assist in the future analysis of this land use, it is important to collect and include information on the presence and size of garden centers, outdoor fenced-in space and service stations in trip generation data submissions.***

#### Source Numbers

126, 376, 434, 437, 507, 616, 617, 728, 731

## Land Use: 881

### Pharmacy/Drugstore with Drive-Through Window

#### Description

Pharmacies/drugstores are retail facilities that primarily sell prescription and non-prescription drugs. These facilities may also sell cosmetics, toiletries, medications, stationery, personal care products, limited food products and general merchandise. The drug stores in this category contain drive-through windows. Pharmacy/drugstore without a drive-through window (Land Use 880) is a related use.

#### Additional Data

Several studies indicated that they had two drive-through windows.

Peak hours of the generator—

The weekday A.M. peak hour varied between 8:00 a.m. and 12:00 p.m. The weekday P.M. peak hour varied between 12:00 p.m. and 6:00 p.m. The weekend peak hour varied between 12:00 p.m. and 7:00 p.m.

The sites were surveyed between the 1990s and the 2000s in California, Colorado, Florida, Minnesota, New Hampshire, New Jersey, New York, Pennsylvania, Vermont and Wisconsin.

*To assist in the future analysis of this land use, it is important that the number of drive-through lanes at the study site be reported.*

#### Source Numbers

369, 418, 436, 547, 550, 552, 563, 568, 573, 599, 621, 716, 727, 728, 734

## Land Use: 912

### Drive-in Bank

#### Description

Drive-in banks provide banking facilities for motorists who conduct financial transactions from their vehicles; many also serve patrons who walk into the building. The drive-in lanes may or may not provide automatic teller machines (ATMs). Walk-in bank (Land Use 911) is a related use.

#### Additional Data

To reflect changes in travel patterns resulting from recent technological advances in the banking industry, data from years prior to the year 2000 have been removed from this land use. The elimination of these data resulted in substantially lower trip generation rates for most time periods presented.

The independent variable, drive-in lanes, refers to all lanes at a banking facility used for financial transactions, including ATM-only lanes.

Peak hours of the generator—

The weekday A.M. peak hour varied between 8:00 a.m. and 12:00 p.m. The weekday P.M. peak hour varied between 12:00 p.m. and 6:00 p.m. The weekend peak hour varied between 9:00 a.m. and 1:30 p.m.

The sites were surveyed in the 2000s throughout the United States.

***To assist in the future analysis of this land use, it is important that Friday data be collected and reported separately from weekday data. It is also important to specify the date and month of the data collection period and the number of drive-through lanes that are open at the time of the study.***

#### Specialized Land Use Data

One study provided data on a drive-in bank with an office on the second floor. The size and scale of this site differs considerably from those contained in this land use. Therefore, the information collected for this facility is presented in the following table and was excluded from the data plots.

## Land Use: 932

### High-Turnover (Sit-Down) Restaurant

#### Description

This land use consists of sit-down, full-service eating establishments with typical duration of stay of approximately one hour. This type of restaurant is usually moderately priced and frequently belongs to a restaurant chain. Generally, these restaurants serve lunch and dinner; they may also be open for breakfast and are sometimes open 24 hours per day. These restaurants typically do not take reservations. Patrons commonly wait to be seated, are served by a waiter/waitress, order from menus and pay for their meal after they eat. Some facilities contained within this land use may also contain a bar area for serving food and alcoholic drinks. Quality restaurant (Land Use 931), fast-food restaurant without drive-through window (Land Use 933), fast-food restaurant with drive-through window (Land Use 934) and fast-food restaurant with drive-through window and no indoor seating (Land Use 935) are related uses.

#### Additional Data

*Users should exercise caution when applying statistics during the A.M. peak periods, as the sites contained in the database for this land use may or may not be open for breakfast. In cases where it was confirmed that the sites were not open for breakfast, data for the A.M. peak hour of the adjacent street traffic were removed from the database.*

Information on approximate hourly variation in high-turnover (sit-down) restaurant traffic is shown in the following table. It should be noted, however, that the information contained in this table is based on a limited sample size. Therefore, caution should be exercised when applying the data. Also, some information provided in the table may conflict with the results obtained by applying the average rate or regression equations. When this occurs, it is suggested that the results from the average rate or regression equations be used, as they are based on a larger number of studies.

## **Land Use: 937**

### **Coffee/Donut Shop with Drive-Through Window**

#### **Description**

This land use includes single-tenant coffee and donut restaurants with drive-through windows. Freshly brewed coffee and a variety of coffee-related accessories are the primary retail products sold at these sites. They may also sell other refreshment items, such as donuts, bagels, muffins, cakes, sandwiches, wraps, salads and other hot and cold beverages. Some sites may also sell newspapers, music CDs and books. The coffee and donut shops contained in this land use typically hold long store hours (over 15 hours) with an early morning opening. Also, limited indoor seating is generally provided for patrons; however, table service is not provided. Coffee/donut shop without drive-through window (Land Use 936), coffee/donut shop with drive-through window and no indoor seating (Land Use 938), bread/donut/bagel shop without drive-through window (Land Use 939) and bread/donut/bagel shop with drive-through window (Land Use 940) are related uses.

#### **Additional Data**

Most of the facilities in this land use were in free-standing buildings in retail shopping areas. Some of the facilities were located within a shopping center or as an outparcel to a shopping center. Some of the facilities shared parking areas with one or more other businesses.

It should be noted that those stores specializing in the sale of coffee (Land Uses 936-938) generated higher trip generation rates than those specializing in other products (Land Uses 939-940).

The sites were surveyed between the 1990s and the 2000s throughout the United States.

#### **Specialized Land Use Data**

Current industry trends have resulted in the emergence of several coffee/donut shops combined with other types of restaurants. The trip generation characteristics of these facilities differ from the facilities typically contained in this land use, as their sizes, trip generation rates and peak hour of service vary considerably. Therefore, the information collected for these facilities is presented in the following table and was excluded from the data plots.

## **Land Use: 630 Clinic**

### **Description**

A clinic is any facility that provides limited diagnostic and outpatient care but is unable to provide prolonged in-house medical and surgical care. Clinics commonly have lab facilities, supporting pharmacies and a wide range of services (compared to the medical office, which may only have specialized or individual physicians). Hospital (Land Use 610) and medical-dental office building (Land Use 720) are related uses.

### **Additional Data**

The peak hour of the generator typically coincided with the peak hour of the adjacent street traffic.

The sites were surveyed between the 1960s and the 2000s in California, Illinois, New Hampshire and Vermont.

### **Source Numbers**

19, 98, 440, 728, 734

## Land Use: 710

### General Office Building

#### Description

A general office building houses multiple tenants; it is a location where affairs of businesses, commercial or industrial organizations, or professional persons or firms are conducted. An office building or buildings may contain a mixture of tenants including professional services, insurance companies, investment brokers and tenant services, such as a bank or savings and loan institution, a restaurant or cafeteria and service retail facilities. Corporate headquarters building (Land Use 714), single tenant office building (Land Use 715), office park (Land Use 750), research and development center (Land Use 760) and business park (Land Use 770) are related uses.

If information is known about individual buildings, it is suggested that the general office building category be used rather than office parks when estimating trip generation for one or more office buildings in a single development. The office park category is more general and should be used when a breakdown of individual or different uses is not known. If the general office building category is used and if additional buildings, such as banks, restaurants, or retail stores, are included in the development, the development should be treated as a multiuse project. On the other hand, if the office park category is used, internal trips are already reflected in the data and do not need to be considered.

When the buildings are interrelated (defined by shared parking facilities or the ability to easily walk between buildings) or house one tenant, it is suggested that the total area or employment of all the buildings be used for calculating the trip generation. When the individual buildings are isolated and not related to one another, it is suggested that trip generation be calculated for each building separately and then summed.

#### Additional Data

Average weekday transit trip ends—

Transit service was either nonexistent or negligible at the majority of the sites surveyed in this land use. Users may wish to modify trip generation rates presented in this land use to reflect the presence of public transit, carpools and other transportation demand management (TDM) strategies. Information has not been analyzed to document the impacts of TDM measures on the total trip generation of a site. See the *ITE Trip Generation Handbook*, Second Edition for additional information on this topic.

The average building occupancy varied considerably within the studies for which occupancy data were provided. For buildings with occupancy rates reported, the average occupied gross leasable area was 88 percent.

Some of the regression curves plotted for this land use may produce illogical trip-end estimates for small office buildings. When the proposed site size is significantly smaller than the average-sized facility published in this report, caution should be used when applying these statistics. For more information, please refer to Chapter 3, "Guidelines for Estimating Trip Generation," of the *ITE Trip Generation Handbook*, Second Edition.

## **Land Use: 720**

### **Medical-Dental Office Building**

#### **Description**

A medical-dental office building is a facility that provides diagnoses and outpatient care on a routine basis but is unable to provide prolonged in-house medical and surgical care. One or more private physicians or dentists generally operate this type of facility. Clinic (Land Use 630) is a related use.

#### **Additional Data**

The average vehicle occupancy for the six studies for which information was submitted was approximately 1.37 persons per automobile. The vehicle occupancy rates ranged from 1.32 to 1.44 persons per automobile.

The sites were surveyed between the 1980s and the 2000s throughout the United States.

#### **Source Numbers**

8, 19, 98, 104, 109, 120, 157, 184, 209, 211, 253, 287, 294, 295, 304, 357, 384, 404, 407, 423, 444, 509, 601, 715

## **Land Use: 760**

### **Research and Development Center**

#### **Description**

Research and development centers are facilities or groups of facilities devoted almost exclusively to research and development activities. The range of specific types of businesses contained in this land use category varies significantly. Research and development centers may contain offices and light fabrication areas. General office building (Land Use 710), corporate headquarters building (Land Use 714), single tenant office building (Land Use 715), office park (Land Use 750) and business park (Land Use 770) are related uses.

#### **Additional Data**

Truck trips accounted for 1.84 percent of the weekday traffic at the research and development centers surveyed (range of 0.4 percent to 4.0 percent).

The average vehicle occupancy for the 13 studies for which information was submitted was approximately 1.19 persons per automobile. The vehicle occupancy rates ranged from 1.10 to 1.33 persons per automobile.

The sites were surveyed between the 1960s and the 2000s throughout the United States.

#### **Trip Characteristics**

The trip generation for the A.M. and P.M. peak hours of the generator typically coincided with the peak hours of the adjacent street traffic; therefore, only one A.M. peak hour and one P.M. peak hour, which represent both the peak hour of the generator and the peak hour of the adjacent street traffic, are shown for research and development centers.

#### **Source Numbers**

9, 105, 213, 218, 253, 332, 384, 423, 630, 715, 723

## **Land Use: 770 Business Park**

### **Description**

Business parks consist of a group of flex-type or incubator one- or two-story buildings served by a common roadway system. The tenant space is flexible and lends itself to a variety of uses; the rear side of the building is usually served by a garage door. Tenants may be start-up companies or small mature companies that require a variety of space. The space may include offices, retail and wholesale stores, restaurants, recreational areas and warehousing, manufacturing, light industrial, or scientific research functions. The average mix is 20 to 30 percent office/commercial and 70 to 80 percent industrial/warehousing. Industrial park (Land Use 130), warehousing (Land Use 150), general office building (Land Use 710), corporate headquarters building (Land Use 714), single tenant office building (Land Use 715), office park (Land Use 750) and research and development center (Land Use 760) are related uses.

### **Additional Data**

The sites were surveyed between the 1980s and the 2000s throughout the United States.

### **Trip Characteristics**

The trip generation for the A.M. and P.M. peak hours of the generator typically coincided with the peak hours of the adjacent street traffic; therefore, only one A.M. peak hour and one P.M. peak hour, which represent both the peak hour of the generator and the peak hour of the adjacent street traffic, are shown for business parks.

### **Source Numbers**

155, 211, 212, 213, 216, 407, 423, 715, 728